

Amendments to the Claims

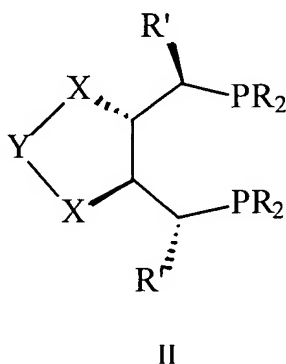
This listing will replace all prior versions and listings of claims in the application:

Listing of Claims

Claims 1-32 (canceled)

The following new claims are added:

-- 33. (new) A catalyst prepared by a process comprising: contacting a transition metal salt, a complex thereof or a transition metal complex, and a ligand selected from compounds represented by formula II or its enantiomer:



wherein R' is selected from the group consisting of: alkyl, aryl, substituted alkyl and substituted aryl;

wherein each X is O;

wherein each Y is independently selected from the group consisting of: a diol protecting group residue, C(OR)₂, CH(OR), CH₂, CHR and CR₂; and

wherein each R is independently selected from the group consisting of: alkyl, aryl, substituted alkyl, substituted aryl, fluoroalkyl and perfluoroalkyl.

34. (new) The catalyst of claim 33, having an optical purity of at least 85% ee.

35. (new) The catalyst of claim 33, having an optical purity of at least 95% ee.

36. (new) The catalyst of claim 33, wherein said transition metal is selected from the group consisting of:

Pt, Pd, Rh, Ru, Ir, Cu, Ni, Mo, Ti, V, Re and Mn.

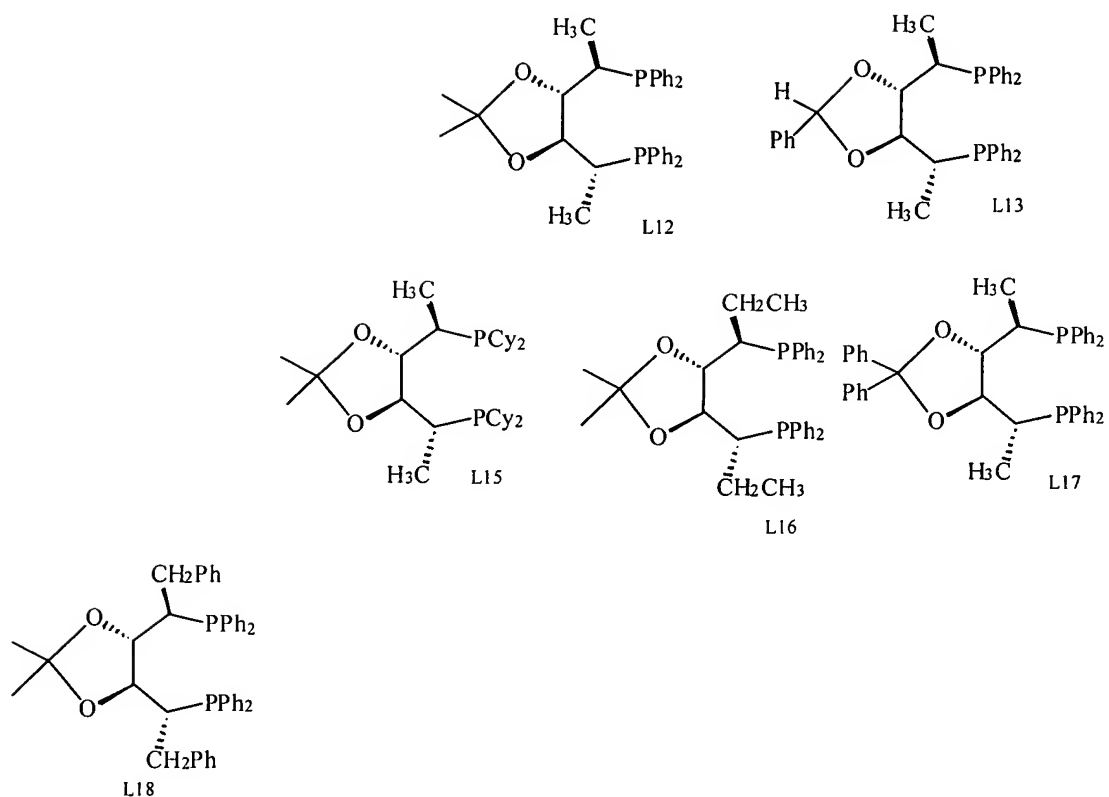
37. (New) The catalyst of claim 36, wherein said transition metal salt, complex thereof, or transition metal complex is selected from the group consisting of:

PtCl₂; Pd₂(DBA)₃; Pd(OAc)₂; PdCl₂(RCN)₂; (Pd(allyl)Cl)₂; (Rh(COD)Cl)₂; (Rh(COD)₂)X; Rh(acac)(CO)₂; Rh(ethylene)₂(acac); Rh(CO)₂Cl₂; Ru(RCOO)₂(diphosphine); Ru(methylallyl)₂(diphosphine); Ru(aryl group)X₂(diphosphine); RuCl₂(COD); (Rh(COD)₂)X; RuX₂(diphosphine); RuCl₂(=CHR)(PR'₃)₂; Ru(ArH)Cl₂; Ru(COD)(methylallyl)₂; (Ir(COD)₂Cl)₂; (Ir(COD)₂)X; Cu(OTf); Cu(OTf)₂; Cu(Ar)X; CuX; NiX₂; Ni(COD)₂; MoO₂(acac)₂; Ti(OiPr)₄; VO(acac)₂; MeReO₃; MnX₂ and Mn(acac)₂; wherein each R and R' is independently selected from the group consisting of: alkyl or aryl; Ar is an aryl group; and X is a counteranion.

38. (new) The catalyst of claim 37, wherein said counteranion X is selected from the group consisting of: halogen, BF₄[⊖], B(Ar)₄[⊖] wherein Ar is 3,5-di-trifluoromethyl-1-phenyl, ClO₄[⊖], SbF₆[⊖], CF₃SO₃[⊖], RCOO[⊖] and a mixture thereof.

39. (new) The catalyst of claim 33, prepared in situ or as an isolated compound.

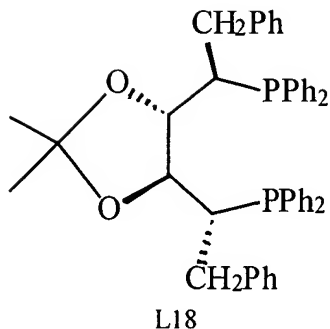
40. (new) The catalyst of claim 33, wherein said ligand is selected from the group consisting of compounds represented by the formula:



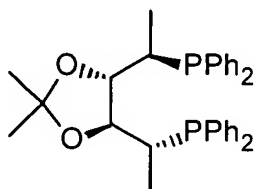
wherein Cy is cyclohexyl group.

41. (new) The catalyst of claim 40, wherein said catalyst is a Rh complex of said ligands.

42. (new) The catalyst of claim 33, wherein said catalyst is a Rh complex of ligand L₁₈ represented by the formula:



43. (new) A catalyst prepared by a process comprising: contacting a transition metal salt, a complex of said transition metal salt, or a transition metal complex, and an (R,S,S,R)-DIOP* ligand represented by the formula:



(R,S,S,R)-DIOP*

44. (new) The catalyst of claim 43, wherein said transition metal is selected from the group consisting of:

Pt, Pd, Rh, Ru, Ir, Cu, Ni, Mo, Ti, V, Re and Mn.

45. (New) The catalyst of claim 44, wherein said transition metal salt, complex thereof, or transition metal complex is selected from the group consisting of:

PtCl₂; Pd₂(DBA)₃; Pd(OAc)₂; PdCl₂(RCN)₂; (Pd(allyl)Cl)₂; (Rh(COD)Cl)₂; (Rh(COD)₂)X; Rh(acac)(CO)₂; Rh(ethylene)₂(acac); Rh(CO)₂Cl₂; Ru(RCOO)₂(diphosphine); Ru(methylallyl)₂(diphosphine); Ru(aryl group)X₂(diphosphine); RuCl₂(COD); (Rh(COD)₂)X; RuX₂(diphosphine); RuCl₂(=CHR)(PR'₃)₂; Ru(ArH)Cl₂; Ru(COD)(methylallyl)₂; (Ir(COD)₂Cl)₂; (Ir(COD)₂)X; Cu(OTf); Cu(OTf)₂; Cu(Ar)X; CuX; NiX₂; Ni(COD)₂; MoO₂(acac)₂; Ti(OiPr)₄; VO(acac)₂;

MeReO₃; MnX₂ and Mn(acac)₂; wherein each R and R' is independently selected from the group consisting of: alkyl or aryl; Ar is an aryl group; and X is a counteranion.

46. (new) The catalyst of claim 45, wherein said counteranion X is selected from the group consisting of:

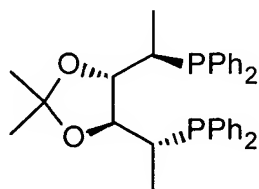
halogen[⊖], BF₄[⊖], B(Ar)₄[⊖] wherein Ar is 3,5-di-trifluoromethyl-1-phenyl, ClO₄[⊖], SbF₆[⊖], CF₃SO₃[⊖], RCOO[⊖] and a mixture thereof.

47. (new) The catalyst of claim 43, prepared in situ or as an isolated compound.

48. (new) The catalyst of claim 43, wherein said catalyst is an Rh complex of (R,S,S,R)-DIOP*.

49. (new) The catalyst of claim 43, wherein said catalyst is an Ru complex of (R,S,S,R)-DIOP*.

50. (new) A catalyst prepared by a process comprising: contacting a rhodium salt, a complex of said rhodium salt or a complex of rhodium, and an (R,S,S,R)-DIOP* ligand represented by the formula:



(R,S,S,R)-DIOP*

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